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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

ORIGINAL FILE

In the Matter of	)	
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Redevelopment of Spectrum To Encourage Innovation in the Use of New Telecommunications Technologies	)	ET Docket No. 92-9

To: The Commission

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COMMENTS OF CENTEL CORPORATION

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SUMMARY

Centel, through its telephone and cellular subsidiaries, operates almost 400 microwave paths in the 2.11-2.13 GHz and 2.16-2.18 GHz common carrier bands. These facilities form the underlying networks for the provision of telephone and cellular services. By conservative estimates, the cost of replacing Centel's facilities alone would be $9.75 million.

The Office of Engineering and Technology Report on 1.8-2.2 GHz spectrum usage confirms extensive common carrier industry reliance upon 2 GHz microwave systems. The Report shows that the common carrier band utilization is nearly three times that found in the private radio 1.85-1.99 GHz microwave frequencies. Cellular use, in particular, has increased dramatically in the past several years as new cell sites are deployed.

Against this backdrop, the Commission should carefully consider the ramifications of relocating 2 GHz common carrier licensees. As highlighted herein, Centel believes that several principles should govern the Commission's decision on how best to redevelop the microwave band to accommodate emerging technologies while minimizing the effects on existing services:

First, the Commission should ensure that existing 2 GHz services are not unnecessarily or prematurely disrupted. The Notice of Proposed Rulemaking largely ignores spectrum sharing technologies that might allow new services to co-exist with current microwave operations. Yet, numerous PCS pioneer preference requests contemplate spectrum sharing possibilities. The Commission ought to fully evaluate these proposals before

concluding that relocation of all current microwave licensees is warranted.

Second, if relocation is required, the Commission should provide for appropriate transition periods to permit the orderly and least costly migration to alternative frequencies or facilities. The Notice's proposed ten to fifteen year grandfathering period would appear to be the minimum necessary for common carrier microwave operations. The extensive common carrier 2 GHz networks, relatively new equipment and dramatic growth rates all dictate substantial time frames for any involuntary relocation. Accordingly, Centel recommends at least a fifteen year transition period.

Third, suitable alternative frequencies or facilities should be available before any mandatory relocation occurs. Centel's field experience suggests that technical, zoning and environmental factors may create circumstances where relocation to other facilities is unrealistic or impractical. The Commission's policies should recognize these possibilities and ensure that the termination of 2 GHz services will not occur unless suitable alternatives are available.

Finally, the Notice and OET Report do not fully account for the wide range of costs and burdens that involuntary relocation would impose upon common carrier licensees. Section III.D. below sets forth a more accurate depiction of the impact of the proposed actions upon common carrier microwave licensees. These costs should be recognized and considered in evaluating redevelopment options for the 1.8-2.2 GHz band.

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COMMENTS OF CENTEL CORPORATION

Centel Corporation ("Centel") hereby submits its comments on the Commission's Notice of Proposed Rulemaking in the above-captioned proceeding.[1] As detailed below, the proposed relocation of microwave operations in the 2.11-2.13 GHz and 2.16-2.18 GHz bands to accommodate emerging technologies would impose extremely heavy burdens upon telephone and cellular common carriers. Centel alone would lose over 430 microwave links used today for the delivery of telephone and cellular services across the country. By conservative estimates, the cost of replacing these facilities would exceed $9.75 million.

While Centel strongly supports Commission efforts to create opportunities for emerging technologies, we believe the legitimate interests of existing microwave users must be recognized and safeguarded. Accordingly, the Commission

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[1] Redevelopment of Spectrum To Encourage Innovation in the Use of New Telecommunications Technologies, 7 FCC Rcd 1542 (1992) (Notice of Proposed Rulemaking) [hereinafter "Notice"].

should ensure that: (1) established services will not be unnecessarily or prematurely displaced; (2) appropriate transition periods will be established for the orderly and least costly migration to other frequencies; (3) suitable alternative facilities are available before any mandatory relocation occurs; and (4) the special problems and costs of relocating common carrier microwave users are fully recognized. Adherence to these principles will promote the Commission's goal of facilitating new services and minimizing disruptions to established services.

I. INTRODUCTION

In the Notice, the Commission proposes to reallocate 220 MHz of the 1.85 to 2.20 GHz band ("2 GHz band") for emerging telecommunications technologies. To accommodate existing users of the band, the Commission proposes to make available all fixed microwave bands above 3 GHz. Specific eligibility requirements would be waived for relocated entities. However, 2 GHz microwave users would still be required to comply with the technical rules and coordination procedures applicable to the higher frequency bands.

Under the proposal, existing 2 GHz microwave licensees would be granted a ten to fifteen year transition period during which they could continue to operate within the subject band on a co-primary basis with providers of new

services.[2] During this time, existing users would be able to negotiate financial arrangements with new service providers for early relocation. At the end of this period, existing non-government users remaining within the 2 GHz band would be afforded secondary status only.

II. THE 2 GHZ BAND IS USED EXTENSIVELY BY CENTEL AND OTHER COMMON CARRIERS TO PROVIDE ESSENTIAL COMMUNICATIONS SERVICES

Centel is an extensive user of 2 GHz microwave facilities. Central Telephone Company and its subsidiaries currently hold licenses for 20 2 GHz common carrier microwave stations, representing 40 paths, throughout its telephone exchange markets. In connection with its operation of over 90 cellular markets, Centel Cellular Company and its subsidiaries hold licenses for approximately 200 2 GHz common carrier microwave stations, representing over 350 paths.

The 2 GHz frequencies have propagation and cost characteristics particularly well suited for telephone and cellular purposes. Unlike fiber or wire alternatives,

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[2] Applications for new 2 GHz microwave facilities submitted after the adoption date of the Notice (January 16, 1992) would generally be authorized on a secondary basis only, conditioned on the outcome of this proceeding. The Commission recently restated this policy to indicate that requests for modifications to existing facilities or new facilities operationally connected to a system licensed prior to the adoption date may be awarded primary status upon proper showing to the Commission. See FCC Public Notice, Two Gigahertz Fixed Microwave Licensing Policy, Mimeo No. 23115 (May 14, 1992).

microwave links are not susceptible to often prolonged interruption due to human error or to damage resulting from flooding or heavy precipitation. Accordingly, they are critical links that help ensure greater telephone and cellular performance and reliability.

In addition, installation costs are frequently less for microwave facilities than for other wireline connections. The economic advantages of microwave facilities are particularly pronounced in rural or remote areas, where the cost of installing a landline connection could be prohibitive. Moreover, microwave links are often the only practical means of accessing mountain peaks or other hard-to-reach locations. A large number of Centel's microwave facilities are located in rural and remote areas.

The favorable propagation characteristics of 2 GHz microwave frequencies make them extremely attractive and important for cellular operations. Centel has found that the 25 mile practical path limit of 2 GHz microwave transmissions provides the ideal path length for interconnecting adjacent cell sites.[3] These frequencies will also generally support longer path lengths than higher frequency bands and will enable more economical interconnection over greater

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[3] Since the typical coverage of a cell in a non-congested area is approximately 10-12 radial miles, the standard path length for links among cell sites and the mobile telephone switching office is 20-25 miles.

distances. In addition, 2 GHz paths are not as susceptible to fading and outages caused by rain as are higher frequency bands. Also, 2 GHz frequencies have superior propagation characteristics over large water areas. For companies like Centel, which have a number of systems located near or incorporating large bodies of water, this is a critical concern.

Because of these attractive characteristics, the 2 GHz common carrier microwave frequencies are heavily used. The OET Report shows that 6,823 facilities are currently licensed in the 2.11-2.13 GHz and 2.16-2.18 GHz bands, constituting approximately 170 facilities per megahertz.[4] By contrast, the same study reports approximately 66 facilities per megahertz operated by private radio licensees in the 1.85-1.99 GHz band.[5]

The utilization of 2 GHz facilities has increased dramatically in recent years. Centel, for example, has substantially expanded its construction of 2 GHz paths as its rural cellular markets have come on line and all of its systems continue to grow. Indeed, approximately 75 percent of Centel Cellular's 2 GHz microwave equipment is less than two years old -- at the very beginning of its useful life.

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[4] "Creating New Technology Bands for Emerging Telecommunications Technology," FCC/OET TS 91-1 at 8 (December 1991) [hereinafter "OET Report"].

[5] Id.

The same is undoubtedly true for many other cellular carriers.

Prior to the initiation of this proceeding, this extensive use of 2 GHz frequencies by common carriers could only have been expected to increase. If the 2 GHz band were left available for cellular use, Centel Cellular projects that 95 percent of all of its future microwave paths would be designed in this band.

III. THE COMMISSION MUST ENSURE THAT EXISTING 2 GHZ USERS ARE NOT UNNECESSARILY RELOCATED AND THAT THE COSTS OF ANY RELOCATION ARE MINIMIZED

With the extensive use of 2 GHz common carrier microwave frequencies, the Commission should consider carefully the ramifications of requiring existing users to abandon their current reliable and economical facilities. In order to facilitate the development of emerging technologies while minimizing the burden on existing 2 GHz users, any relocation plan eventually adopted should be consistent with the following principles.

A. The Commission Should Thoroughly Explore Possible Spectrum Sharing Techniques Before Requiring the Relocation of Existing 2 GHz Users

Given the potential deleterious impact of relocation on existing 2 GHz users, the Commission must ensure that such a step is not undertaken unnecessarily or prematurely. The

Notice assumes that wholesale relocation of existing 2 GHz microwave licensees is necessary to accommodate as yet unidentified emerging technologies, ignoring spectrum sharing possibilities that might allow new services to co-exist with current microwave operations.

Clearly, viable spectrum sharing techniques would offer a better solution. Such a solution would facilitate the development of emerging technologies while obviating the need for relocation and disruption of existing 2 GHz operations. As detailed below, a number of pending proposals contemplate spectrum sharing. The Commission should not conclude that relocation is necessary without first fully evaluating these potential opportunities.

1. "Part 16" PCS Service

One of these proposals, the "Part 16" option, envisions that wireless PBX systems, enhanced cordless phone services, and wireless data networks operating on an in-building or on-premises basis would be able to share spectrum with existing 2 GHz users.[6] By adopting a regulatory scheme similar to the

[6] The Part 16 option was initially described by Craig McCaw in his PCS En Banc Hearing Testimony. In its supplement to its petition for rulemaking to allocate spectrum for PCS, American Personal Communications proposed a similar allocation for unlicensed services in the 1.90-1.93 GHz and 1.98-1.99 GHz bands. American Personal Communications Supplement to Petition for Rulemaking for Amendment of the Commission's Rules to Allocate Spectrum for

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Commission's current Part 15 rules for non-licensed radio devices, such localized services could share use of the 2 GHz band on a non-interference basis. The proponents of the Part 16 approach assert that multiple providers of such services could co-exist with existing users if they had a 10 MHz exclusive allocation and a total allocation of at least 50 MHz.

The 1.91-1.93 GHz band has been suggested as appropriate spectrum to allocate for the exclusive use of Part 16 services. Given the low density use of these frequencies, Part 16 devices may be able to operate in this band without the need to relocate any existing users. Any possible relocation would only require a small number of stations to adjust their existing equipment to retune to other frequencies in the 1.85-1.99 GHz band. In addition to this exclusive allocation, the adjacent frequencies could be made available to Part 16 devices on a co-primary shared basis with existing microwave users. Pursuing this option would allow the Commission to facilitate the implementation of several promising emerging technologies while avoiding many of the substantial problems inherent in the 2 GHz relocation currently contemplated.

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[6](...continued)
the Provision of Personal Communications Services ("PCS") and PCS Microwave, and To Create a New Subpart of the Commission's Rules To Authorize PCS as a New Service, RM-____ (filed May 4, 1992).

2. Other PCS Spectrum Sharing Proposals

In addition to the Part 16 option, there are a number of other PCS spectrum sharing proposals currently pending. Indeed, twenty-four of the thirty-eight pioneer preference requests placed on the May 11, 1992 Public Notice[7] concerned innovative services that could co-exist with existing 2 GHz users.[8] Using such spectrum sharing techniques as Code Division Multiple Access ("CDMA"), Time Division Multiple Access ("TDMA"), Frequency Agile Sharing Technology ("FAST"), and others, these proposals cover a wide range of new services.

A majority of these proposals contemplate the provision of person-to-person wireless two-way voice services that could share spectrum with existing 2 GHz users. Some of these propose using an independent microcell network,[9] while others would rely on the existing public switched telephone

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[7] FCC Public Notice, Pioneer's Preference Requests Accepted in GEN Docket No. 90-314, Mimeo No. 23063 (May 11, 1992).

[8] In addition, PCS was proposed as a viable offering in higher frequency bands. See, e.g., American Telephone & Telegraph Request for Pioneer's Preference, PP-43 (May 4, 1992) (proposing PCS service on a co-primary basis in the 6 GHz band).

[9] See, e.g., American Personal Communications Request for Pioneer's Preference, PP-6 (July 30, 1991); PCN America Request for Pioneer's Preference, PP-65 (May 4, 1992).

network ("PSTN"),[10] cellular[11] or cable infrastructure.[12] Several of these person-to-person services would also offer enhanced telephone services, such as call screening, caller ID and answering services to subscribers.[13]

Other proposals contemplate various forms of advanced cordless telephone or telepoint services that access the PSTN.[14] These range from wireless local loop and wireless PBX applications to cordless residential telephone and public base station services. Several others also propose high speed wireless data transmission either through independent networks or wireless PBX-type arrangements.[15]

The Commission should carefully consider and thoroughly explore the wide range of spectrum sharing proposals before making a final decision to require the relocation of existing users. Further, the Commission should continue to encourage

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[10] See, e.g., Pacific Bell Request for Pioneer's Preference, PP-61 (May 4, 1992).

[11] See, e.g., Cellular Service, Inc. Request for Pioneer's Preference, PP-49 (May 4, 1992).

[12] See, e.g., Cox Enterprises, Inc. Request for Pioneer's Preference, PP-52 (May 4, 1992).

[13] See, e.g., Viacom International Inc. Request for Pioneer's Preference, PP-78 (May 4, 1992).

[14] See, e.g., Corporate Technology Partners Request for Pioneer's Preference, PP-51 (May 4, 1992).

[15] See, e.g., Omnipoint Corporation, Oracle Data Publishing, Inc. and McCaw Cellular Communications, Inc., PP-59 (May 4, 1992).

the research and development of emerging technologies that can share spectrum with existing users. This route is clearly in the public interest.

B. The Commission Should Provide for Appropriate Transition Periods To Permit the Orderly and Least Costly Migration to Alternative Facilities

The Notice proposes a ten to fifteen year transition period during which existing 2 GHz microwave users would have grandfather rights to the subject band. Centel strongly supports such grandfather rights in order to minimize the cost of relocating existing users. Such users must have a reasonable opportunity to recoup the substantial investment in their existing equipment before being required to expend significant sums for relocation and new facilities.

The proposed ten to fifteen year transition period appears to be the minimum time necessary for the relocation of common carrier microwave operations. Although the Notice states that a ten to fifteen year period would allow the complete amortization of existing 2 GHz equipment as well as exhaust the equipment's useful life, this may not be true for 2 GHz cellular users. Cellular microwave links are relatively new and their use has increased markedly in recent years. As stated above, approximately 75 percent of Centel

Cellular's 2 GHz equipment is less than 2 years old.[16] Accordingly, Centel recommends that the Commission adopt at least a fifteen year transition period.

Centel also urges the Commission to allow 2 GHz microwave licensees to retain their primary status in the 2 GHz band after conclusion of the transition period, until new emerging technologies licensees seek use of the spectrum. As mentioned above, many existing 2 GHz microwave paths are located in rural and remote areas -- where new emerging technologies operators may not initially, or indeed ever, seek to provide service.[17] Thus, requiring the transition for these users, prior to expression of interest by emerging technologies providers, would be premature. The adoption of this proposal would minimize the disruption and costs to current users while not precluding the availability of spectrum to providers of new technologies.[18]

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[16] The OET Report similarly notes that half of the common carrier 2 GHz equipment in use today is less than 3 years old. OET Report at 32.

[17] It is also possible that the respective spectrum needs of fixed microwave and emerging technologies operators may be such in these less populated areas that they can successfully co-exist without disruptive interference.

[18] If this proposal is adopted, existing 2 GHz users should be accorded a minimum time period within which to relocate after they are requested to move. Clearly, a 2 GHz licensee might sustain additional costs or derogation in service if it is not able to take the time necessary to ensure a smooth and effective conversion to another connection medium. Such a result would be particularly

(continued...)

Finally, the Commission has properly recognized that existing 2 GHz users need to continue to expand and modify their systems during the transition period to meet the needs of their customers.[19] The FCC's recently released Public Notice protects the primary status of users who modify their existing facilities and add new facilities operationally connected to an existing system, upon proper showing to the Commission. Thus, the clarified policy fulfills the Commission's public interest mandate by acknowledging the legitimate expansion and modification needs of existing users and the potentially detrimental effects of "freezing" existing communications systems.

C. Suitable Alternative Facilities Must Be Available Before Mandatory Relocation Is Required

Contrary to the Notice's assumptions, it is not feasible to relocate certain existing 2 GHz microwave facilities. Moreover, eliminating such facilities in the 2 GHz band could have adverse consequences. Accordingly, Commission policies should not require relocation unless suitable alternative frequencies or facilities are available.

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[18](...continued)
likely if a new licensee waited until the very end of the transition period to ask an existing microwave user to vacate the spectrum (and the microwave user otherwise had no prior indication that it might have to relocate).

[19] FCC Public Notice, Two Gigahertz Fixed Microwave Licensing Policy, Mimeo No. 23115 (May 14, 1992).

1. Technical Obstacles to Relocation

An existing user may be unable to find suitable spectrum in other bands because none is available for interference-free operations. Alternatively, in the absence of any rule changes, loading requirements for other microwave bands may not permit current 2 GHz usage arrangements.[20] This may be a serious problem in rural areas where microwave transmission may be the only cost-effective alternative.

Moreover, an existing user may be prevented from relocating to higher frequency bands due to unacceptable path losses or reliability problems.[21] Because higher frequency bands are more susceptible to performance problems due to rain and large water areas, they tend to be particularly

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[20] This problem underscores the need for the Commission to act promptly to amend its rules to accommodate any conversion of 2 GHz paths to higher band frequencies. See Comments of Centel Corporation on Utilities Telecommunications Council ("UTC") Petition for Rulemaking in the Matter of Amendment of Parts 2, 21, and 94 of the Commission's Rules to Accommodate Private Microwave Systems in the 1.71-1.85 GHz Bands and in Bands Above 3 GHz, RM-7981 (filed June 1, 1992). See also Alcatel Network Systems, Inc. Petition for Rulemaking in the Matter of Amendment of Parts 2, 21, 25 and 94 of the Commission's Rules To Accommodate Common Carrier and Private Op-Fixed Microwave Systems in Bands Above 3 GHz, RM-8004 (filed May 22, 1992).

[21] While the propagation characteristics of the 4 GHz band may not depart significantly from 2 GHz, this band is currently used extensively for the downlink of satellite earth stations. Due to the extreme sensitivity of these receive stations and the difficulty of coordinating a 4 GHz microwave path near one, the use of this band for extensive relocation appears limited.

unreliable for links in areas of heavy rainfall or over bodies of water.[22] For critical telephone and cellular links, such unreliable performance may not be acceptable.[23]

Terrain conditions also may be an impediment to replacement facilities. The nature of the location may prevent the use of landline connections or installation of intermediate hops necessary for operations in higher frequency bands. For example, Centel has several cell sites situated on mountain peaks and in other remote locations. In addition, some paths span large bodies of water. For these situations, there are few feasible replacements. Similarly, local zoning restrictions may prevent the use of the larger equipment or modified tower facilities necessary to support higher frequency paths.

2. Economic Obstacles to Relocation

In those certain situations where replacement with a wire-based alternative or higher frequency microwave system is technically possible, the nature of the use or the terrain

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[22] On one path of 7.8 miles, Centel had a 2 GHz and 18 GHz path operating side-by-side. Over a three year period, the 2 GHz path accumulated total outage of 3 hours due to wave guide damage from a bullet. In contrast, during that same period, the 18 GHz path recorded over 24 hours of outage from weather attenuation alone.

[23] For example, the average annual down time for microwave installations used in connection with Centel's cellular operations is engineered to be approximately 500 seconds or less.

involved may make the construction cost economically infeasible. In order to prevent the termination or deterioration of service, the Commission must permit users without realistic alternatives to continue to operate their current 2 GHz facilities indefinitely on a co-primary basis.

D. The Special Problems and Costs of Common Carrier 2 GHz Users Must Be Fully Recognized

The proposed relocation could have serious disruptive effects on existing 2 GHz uses. Unfortunately, the Notice and the underlying OET Report seriously underestimate the actual relocation costs to the common carrier users of the 2 GHz band.

The OET Report estimates the lost value due to premature replacement of 2 GHz equipment and the cost of relocating to higher frequency bands.[24] As the basis for these estimates, the Report projects that only the radio terminal equipment, antennas, and necessary feed lines would need to be replaced to convert to higher frequencies. Assuming an average cost of $125,000 per transmitter, an average equipment age of 15 years, and an average equipment life of 15 years, the Report concludes that common carrier 2 GHz licensees would suffer a loss in value of their 2 GHz equipment of $83,000 per facility if they were required to relocate immediately.

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[24] OET Report at 31-33.

If relocation were to occur at the conclusion of the transition period -- the projected end of the equipment's useful life -- the OET Report asserts that these losses would not apply, but that users would incur the cost of securing and installing replacement equipment and replacement or supplemental sites. Assuming the cost of equipment for higher microwave frequencies is similar to that for the 2 GHz band, the Report concludes that the average cost of equipment replacement, frequency coordination, upgrades to the antenna structure and other miscellaneous costs would be $25,000 per facility. Accordingly, under this analysis, the cost of replacement equipment alone would be $25,000 per facility.

Accordingly to these estimates, the relocation costs for Centel would total approximately $9.75 million, a substantial amount. Yet, Centel believes that the OET projections seriously underestimate the actual costs that would be sustained by a common carrier 2 GHz user. As detailed below, the Commission has underestimated the costs of certain items and omitted others from consideration.

As an initial matter, the Commission has failed to recognize the significant loss to 2 GHz users resulting from the premature abandonment of their existing equipment. In its calculation, the OET Report assumes an average equipment age of 5 years for common carriers. As mentioned above, Centel's 2 GHz equipment, like that of many cellular

carriers, is nearly brand new. The proposed ten to fifteen year transition period may allow the equipment of many microwave users to be fully depreciated and reach the end of its useful life, but this generally will not be true for cellular carriers.

The Notice's analysis also fails to consider that during the transition period carriers will continually be upgrading and modifying their equipment to meet the needs of their customers. Many carriers will have equipment significantly less than ten years old at the end of the transition period. This scenario is particularly relevant for many cellular carriers whose operations are still growing rapidly and whose microwave systems are likely to undergo substantial modification during the transition period.

Although the OET Report assumes that the cost of equipment for the higher frequency bands would approximate that for 2 GHz frequencies, Centel has not found this to be true. The use of the higher frequency bands generally requires the installation of high performance or diversity antennas which are significantly more expensive than the usual 2 GHz equipment. The OET Report concedes that the majority of high performance antennas currently operating in the 4 to 6 GHz band range from $3000 to $30,000, but inexplicably uses a price of only $15,000 to calculate

average cost.[25] By contrast, the price of a standard 1 to 2 meter 2 GHz antenna usually costs between $900 and $2000.

The use of these high performance or diversity antennas would also require additional expenditures for tower modification. For example, Centel currently uses grid antennas for most of its 2 GHz paths to reduce wind loading on towers. High performance or diversity antennas are generally solid dishes that are likely to increase wind loading, thus requiring strengthening or replacement of the tower. Additional zoning approval, if required, could substantially increase the cost of this modification.

The Commission also fails to consider that the shorter path length capabilities at the higher microwave frequencies may require construction of intermediate repeaters or transmitters/receivers. This would add an additional $250,000 to $300,000 to the relocation costs for that path. This estimate would increase substantially if the intermediate site involved rugged terrain or required zoning approval.

OET seriously underestimates the viability of converting to fiber optic cable. The Report estimates that "fiber could replace a 7 mile two way microwave facility for approximately the same total cost."[26] However, this estimate fails to take

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[25] OET Report at 33.

[26] Id. at 29-30.

into account the total cost of obtaining equipment for fiber and its future maintenance and the cost of right-of-way.[27] Taking as an example a typical 15 mile path in the Dallas, Texas area, Centel estimates that its investment in 2 GHz microwave equipment, including the towers at each end, has been $321,000. According to a recent cost study, replacement of this microwave path with buried fiber optic cable would cost in excess of $680,000. Conversion to this transmission medium could thus require an outlay of approximately twice the initial investment, even without regard to ongoing maintenance costs for the fiber optic cable and the cost of securing right-of-way.

Finally, the Commission ignores the cost of reengineering a system to accommodate wire or fiber connections or the use of higher microwave frequencies. Centel estimates that it will take approximately 80 man hours per path to reengineer each of its 2 GHz facilities. In addition, there will also be substantial costs associated with obtaining necessary supplemental sites and federal, state and local approvals to implement the relocation. All these costs should be considered by the Commission.

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[27] Because cellular carriers do not enjoy right of way access, securing permission to deploy fiber may constitute an insurmountable impediment, or certainly be a source of significant additional costs.

IV. CONCLUSION

In conclusion, Centel recommends that the Commission apply certain principles in deciding how to address current 2 GHz operations:

- Existing services should not be unnecessarily or prematurely eliminated.
- Common carriers should have a minimum fifteen year transition period.
- Replacement spectrum or facilities must be available before any mandatory relocation is imposed.
- The full costs of relocation must be considered.

Action consistent with these guiding concerns will help the Commission to fulfill its obligations under the Communications Act.

Respectfully submitted,

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